

What is Claimed is:

1. A messaging system, comprising:
a client device having stored therein a client application, which is adapted
to be executed by said client device;
a server having stored therein a server application, which is adapted to be
5 executed by said server;
a plurality of wireless networks, each of which is adapted to:
communicate messages between said client device and said server;
and
support one or more wireless network protocols;
10 a protocol gateway encapsulating a fundamental network protocol, which
underlies each of said one or more wireless network protocols;
means for communicating a message between said client application and
said server application, over a selected wireless network protocol through said protocol
gateway, independent of said selected wireless network protocol; and
15 a message router for routing said message between said protocol gateway
and said server, said message router including:
means for authenticating an origin of said message, wherein said
authenticating means authenticates said origin before said message is routed by said
message router; and
20 a database, which is accessible by said message router and adapted
to store information relating to routing and authentication of said message.

2. The messaging system according to claim 1, further comprising a simple
network transport layer application, which is adapted to be executed by said protocol
gateway, and includes a first code segment for defining a maximum segment size, a
second code segment for determining if said message exceeds said maximum segment
5 size, and a third code segment for segmenting said message into a plurality of message
segments, none of which exceeds said maximum segment size.

3. The messaging system according to claim 2, further comprising means for supporting a message retry in each of said wireless network protocols.

4. The messaging system according to claim 2, further comprising means for supporting a message ACK/NACK service in each of said wireless network protocols.

5. A method of communicating a message between a client device having stored therein a client application adapted to be executed by the client device, and a server having stored therein a server application adapted to be executed by the server, over a plurality of wireless networks, each of which is adapted to support one or more wireless network protocols, said method comprising the steps of:

providing a protocol gateway;

within said protocol gateway, encapsulating a fundamental network protocol, which underlies each of said one or more wireless network protocols

10 communicating the message between the client application and the server application, over a selected wireless network protocol through said protocol gateway, independent of said selected wireless network protocol; and

providing a message router for routing the message between said protocol gateway and the server.

6. The method according to claim 5, further comprising the step of, with said message router, authenticating an origin of the message.

7. The method according to claim 6, wherein said authenticating step is performed by said message router before the message is routed between said protocol gateway and the server.

8. The method according to claim 6, further comprising the steps of:
providing a database, which is accessible by said message router; and
storing in said database information relating to routing and authentication of the message.

9. The method according to claim 5, further comprising the steps of:
providing a simple network transport layer (SNTL) application, wherein
said SNTL application is adapted to be executed by said protocol gateway and, with said
SNTL application;

5 defining a maximum segment size;
determining if said message exceeds said maximum segment size; and
segmenting said message into a plurality of message segments, none of
which exceeds said maximum segment size.

10. The method according to claim 5, further comprising the step of
supporting a message retry in each of said wireless network protocols.

11. The method according to claim 5, further comprising the step of
supporting a message ACK/NACK service in each of said wireless network protocols.

12. A method of routing a message in a communications system, comprising:
a server, which is adapted to run a server application;
a plurality of message routers, each of which is coupled to said server;
a plurality of protocol gateways, each of which is coupled to each one of
5 said plurality of message routers; and
a wireless network, which is adapted to couple said server, through one or
more of said plurality of message routers and one or more of said plurality of protocol
gateways, to a plurality of client devices, each of which is adapted to run a client
application;
10 wherein the method comprises the steps of:
transmitting the message from one of said plurality of client devices and,
within said one of said plurality of client devices:
defining a maximum segment size;
determining if the message exceeds said maximum segment size;
15 segmenting the message into one or more message segments, none
of which exceeds said maximum segment size;
receiving the message at one of said plurality of protocol gateways;
transmitting from said one of said plurality of protocol gateways to said
one of said plurality of client devices a first acknowledgment message, which
20 acknowledges receipt of at least one message segment by said one of said plurality of
protocol gateways;
determining, at said one of said plurality of client devices, that said at least
one message segment constitutes a complete message;
in the event that said at least one message segment constitutes a complete
25 message as determined by said one of said plurality of client devices, transmitting from
said one of said plurality of protocol gateways to one of said plurality of message routers
said complete message; and
with said one of said plurality of message routers, routing said complete
message to said server.

13. The method according to claim 12, further comprising the steps of:
transmitting from said server to said one of said plurality of message
routers a second acknowledgment message, which acknowledges receipt of at least one
message segment by said one of said plurality of protocol gateways;

5 receiving said second acknowledgment message at said one of said
plurality of message routers and routing same to said one of said plurality of protocol
gateways;

receiving, from said one of said plurality of message routers, said second
acknowledgment message at said one of said plurality of protocol gateways; and

10 transmitting said second acknowledgment message from said one of said
plurality of protocol gateways to said one of said plurality of client devices transmitting
the message.

14. The method according to claim 12, wherein the message comprises a size that exceeds said maximum segment size, further comprising the steps of:

segmenting the message into a first message segment and a second message segment, neither of which exceeds said maximum segment size;

5 transmitting from said one of said plurality of protocol gateways to said one of said plurality of client devices a first acknowledgment message, which acknowledges receipt of said first message segment by said one of said plurality of protocol gateways;

10 receiving said first acknowledgment message at said one of said plurality of client devices

determining at said one of said plurality of client device that said second message segment was not received by said one of said plurality of protocol gateways;

retransmitting from said one of said plurality of client devices to said one of said plurality of protocol gateways said second message segment; and

15 receiving said retransmitted second message segment at said one of said plurality of protocol gateways; and

20 transmitting from said one of said plurality of protocol gateways to said one of said plurality of client devices a second acknowledgment message, which acknowledges receipt of said second message segment by said one of said plurality of protocol gateways.

15. The method according to claim 14, further comprising the steps of:

determining at said one of said plurality of protocol gateways that said first message segment and said second message segment comprises a complete message; and

5 upon receipt of said retransmitted second message segment by said one of said plurality of protocol gateways, transmitting a complete message acknowledgment message from said one of said plurality of protocol gateways to said one of said plurality of client devices.

16. A method of routing a message in a communications system, comprising:

- a server, which is adapted to run a server application;
- a plurality of message routers, each of which is coupled to said server;
- a plurality of protocol gateways, each of which is coupled to each one of

5 said plurality of message routers; and

- a wireless network, which is adapted to couple said server, through one or more of said plurality of message routers and one or more of said plurality of protocol gateways, to a plurality of client devices, each of which is adapted to run a client application;

10 wherein the method comprises the steps of:

- transmitting the message from said server to one of said plurality of message routers;
- receiving the message at said one of said plurality of message routers, and routing same to one of said plurality of protocol gateways;

15 within said one of said plurality of protocol gateways:

- defining a maximum segment size;
- determining if the message exceeds said maximum segment size;
- segmenting the message into one or more message segments, none of which exceeds said maximum segment size;

20 receiving the message at one of said plurality of protocol gateways;

- transmitting the message from said one of said plurality of protocol gateways to said one of said plurality of client devices;
- receiving the message at said one of said plurality of client devices;
- transmitting an acknowledgment message from said one of said plurality

25 of client devices to said one of said plurality of protocol gateways, wherein said acknowledgment message acknowledges receipt of at least one message segment by said one of said plurality of client devices; and

- determining, at said one of said plurality of client devices, that said at least one message segment constitutes a complete message.

17. The method according to claim 16, wherein the message comprises a size that exceeds said maximum segment size, further comprising the steps of:

within said one of said plurality of protocol gateway, segmenting the message into a first message segment and a second message segment, neither of which
5 exceeds said maximum segment size;

transmitting from said one of said plurality of protocol gateways to said one of said plurality of client devices said first message segment and said second message segment;

receiving said first message segment at said one of said plurality of client
10 devices;

transmitting from said one of said plurality of client devices to said one of said protocol gateways, a first acknowledgment message which acknowledges receipt of said first message segment by said one of said plurality of client devices;

determining at said one of said plurality of protocol gateways that said
15 second message segment was not received by said one of said plurality of client devices;

retransmitting from said one of said plurality of protocol gateways to said one of said plurality of client devices said second message segment; and

receiving said retransmitted second message segment at said one of said plurality of client devices; and

20 transmitting from said one of said plurality of client devices to said one of said plurality of protocol gateways a second acknowledgment message, which acknowledges receipt of said second message segment by said one of said plurality of client devices.

18. The method according to claim 16, further comprising the steps of:
determining at said one of said plurality of protocol gateways that said
first message segment and said second message segment comprises a complete message;
and

5 upon receipt of said retransmitted second message segment by said one of
said plurality of client devices, transmitting a complete message acknowledgment
message from said one of said plurality of protocol gateways to said one of said plurality
of client devices.

18. The method according to claim 16, further comprising the steps of:
determining at said one of said plurality of protocol gateways that said
first message segment and said second message segment comprises a complete message;
and
upon receipt of said retransmitted second message segment by said one of
said plurality of client devices, transmitting a complete message acknowledgment
message from said one of said plurality of protocol gateways to said one of said plurality
of client devices.